

There is much more to be said eventually about hybrid sunflowers, but some of them are very puzzling. We have a long series of plants grown from *H. annuus* pollinated by different perennial species, but showing *only annuus* characters. Other annual  $\times$  perennial crosses have given quite different results, and at present we cannot pretend to understand the various results obtained. Experiments by Sutton in England have proved no less perplexing.\*

The doubling of the rows of rays in annual sunflowers appears to be an old character. La Farge, in "One Hundred Masterpieces of Painting" (1912), reproduces a painting by Van Dyck (1599-1641), in which appears a very large sunflower, with two or three rows of rays.

## CONCERNING SOME SPECIES OF *CARDUUS* IN COLORADO

BY GEO. E. OSTERHOUT

A perplexing group of plants in Colorado is made up of the species of *Carduus*. There are quite a number of species and there are many forms which are intermediate, and do not conform to the descriptions of the recognized species. Dr. Rydberg accounted for many of these by recognizing them as hybrids, Bull. Torrey Club 37. But it is not certain that all these forms are hybrids, and if some of them originated in that way, in time they may have become species, and should be so recognized.

*Carduus Osterhoutii* Rydb., Bull. Torrey Club 32: 131.

One of the species of the high mountains accords more or less with the description of *Cirsium Hookerianum* Nutt. The type locality of this is much farther north, and Dr. Gray did not credit it to the Colorado mountains. In the Synopt. Flora N. A. he says: "Upper wooded and subalpine region of the Rocky Mountains, north of lat. 48°." There is reasonable doubt if this northern plant is found in the Colorado mountains, but Prof.

\* Stand. Cyclop. Hort., 6: 3281. 1917. The *H. annuus*  $\times$  *cucumerifolius* hybrid was reported by A. André in 1913, and again (from plants grown in Sweden) by Lundström in 1914. (Cf. Bot. Centralbl., 1915, No. 10, p. 242; 1916, No. 2, p. 31.) See also Journ. of Heredity, 1915, p. 545.

Nelson has accepted it in the New Manual of Rocky Mountain Botany, using Dr. Gray's description. Dr. Rydberg published it as *C. Osterhoutii*, Bull. Torrey Club 32: 131; and afterward made it a hybrid of *C. griseus* × *scopulorum*, Bull. Torrey Club 37: 548. It is true that there are forms which are intermediate between *C. scopulorum* Greene and this plant, but the plant which Dr. Rydberg described and *C. scopulorum* are as distinct as are *C. Hookerianus* Gray and *C. eriocephalus* Gray as described in the Synopt. Flora N. A.; and if *C. Osterhoutii* is distinct from *C. Hookerianus* I think it should be accepted as a species.

*Carduus araneosus* Osterhout, Bull. Torrey Club 32: 612.

In the New Manual of Rocky Mountain Botany Prof. Nelson made this a synonym of *C. Hookerianus eriocephalus* (Gray) A. Nels., and in his list of hybrid thistles Dr. Rydberg classified it as *C. griseus* × *Parryi*, Bull. Torrey Club 37: 549. *C. Hookerianus eriocephalus* (Gray) A. Nels., which I have been accustomed to label *C. scopulorum* Greene, is very leafy, the narrow leaves thickly beset with prickly teeth, the heads in a close cluster, the involucre bracts narrow and long, of nearly the same length, usually long wooly, and no glutinous spot. *C. araneosus* has broader leaves, the divisions not numerous and comparatively broad, tipped by a weak prickle, the bracts in successive lengths, with a glutinous spot, and arachnoid on the edges. There is scarcely any similarity between the two, and in the natural order they are not closely related. None of the characters which mark *C. Parryi* or *C. griseus* appear in *C. araneosus* to any marked degree; there are neither the "lacerate-fimbriate tips" of *C. Parryi* or the long flat bracts of *C. griseus*, and neither *C. Parryi* or *C. griseus* has a glutinous spot on the bracts. So far as I can see *C. araneosus* is as good a species as most of our Rocky Mountain thistles.

*Carduus laterifolius* Osterhout, Muhlenbergia 1: 141.

This is another species which has a glutinous spot on the involucre bracts. The bracts are in successive lengths and tipped by a slender upright spine. In the typical forms the leaves are broad and little divided; but some other forms which I have placed with it, because they seem nearest to it, have narrower

and more divided leaves. These two are medium-sized thistles, *C. araneosus* 5 to 7 dm. high, rather slender; *C. laterifolius* somewhat larger.

Where in an arrangement of the species of the genus do these two, with a glutinous spot on the involucre bracts, belong? They do not seem to belong with any of the species which have been so characterized in the manuals; not, at least, with the *Undulati* group, for the leaves are glabrate above. Possibly they might be arranged with the *Altissimi*, but they lack the general appearance of that group; they have not the form of the leaf or the shape of the head. They seem, rather, to belong to the *Carlinoides* group, having a resemblance to *C. Americanus*. If they are hybrids one of the parent forms would seem to be *C. Americanus*, and the other some species with a glutinous spot on the involucre bracts. In *C. araneosus* we would have to account for the arachnoid involucre, and in *C. laterifolius* for the broad leaf in the typical forms; in either case the parent form does not seem to be available. Besides there seem to be hybrid forms of *C. Americanus* and *C. laterifolius*, plants with broad leaves, a glutinous spot on the involucre bracts, and fimbriate bracts. Considering their general characteristics it would seem that they belong with the *Carlinoides* group, near to *C. Americanus*.

With the *Carlinoides* group also belong *C. spathulatus* Osterhout, and *C. modestus* Osterhout. *C. aciculatus* Osterhout belongs with the *Undulati*, having a resemblance to the species of that group. It has narrow involucre bracts, slender spreading spines, and leaves tomentose on both sides. It is about as near *C. undulatus* Nutt. as any of our Colorado species.

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## SOME ABNORMAL POPLAR FLOWERS

BY GEORGE T. HASTINGS

In April, 1916, a peculiar tree of the aspen—*Populus grandidentata*—was found beside a new road on the talus slope of the Palisades about opposite 220th Street, New York. The tree at